

# UK Patent Application GB 2 256 499 A

(43) Date of A publication 09.12.1992

(21) Application No 9111044.5

(22) Date of filing 22.05.1991

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(51) INT CL<sup>5</sup>  
H01B 11/22

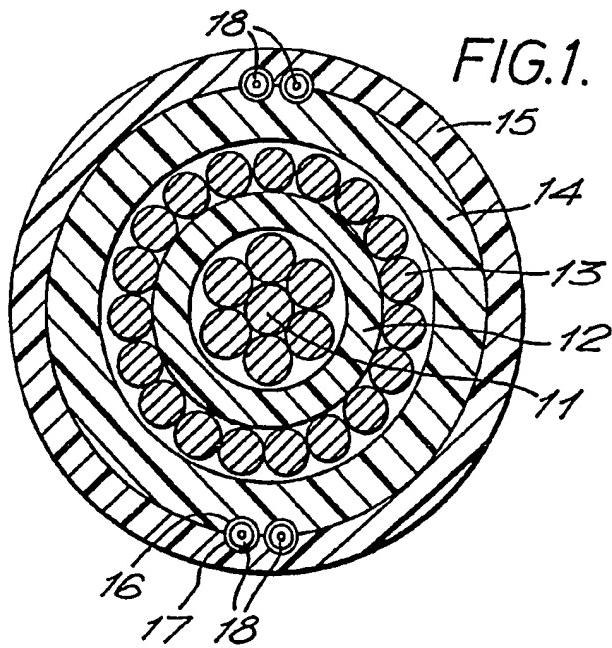
(52) UK CL (Edition K)  
G2J JGCA1 JG20  
U1S S2204 S2208

(56) Documents cited  
GB 2230108 A GB 2227855 A GB 2214653 A  
GB 1592192 A GB 1580863 A GB 1550588 A  
EP 0371660 A1 EP 0359985 A2 WO 84/00820 A1  
US 4936648 A

(58) Field of search  
UK CL (Edition K) G2J JGCA1  
INT CL<sup>5</sup> G02B, H01B

## (54) Electrical cable having two insulated conductors and optic fibre

(57) An electrical supply cable e.g. for a domestic supply, includes inner 11 and outer 13 stranded conductors for the line and neutral supplies respectively. The cable further accommodates optical fibre element(s) 18 for the supply of telecommunications and/or television facilities. The electrical conductors 11, 13 are separated by insulation.



At least one drawing originally filed was informal and the print reproduced here is taken from a later filed formal copy.

The claims were filed later than the filing date within the period prescribed by Rule 25(1) of the Patents Rules 1990.

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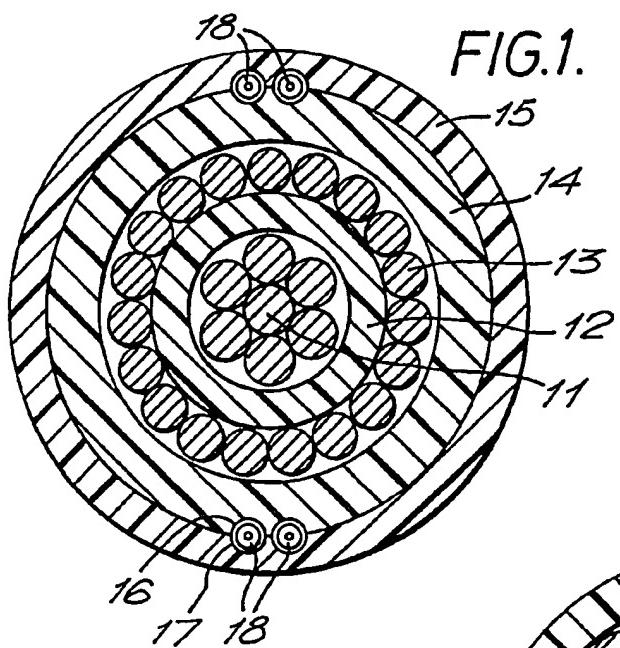
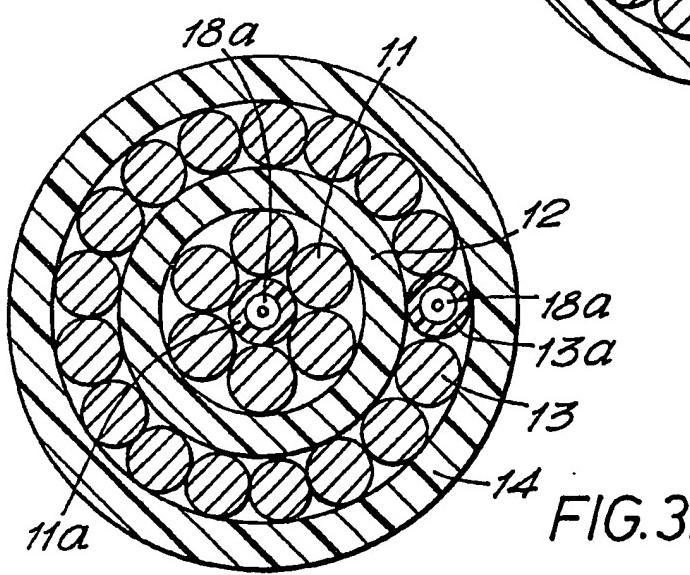
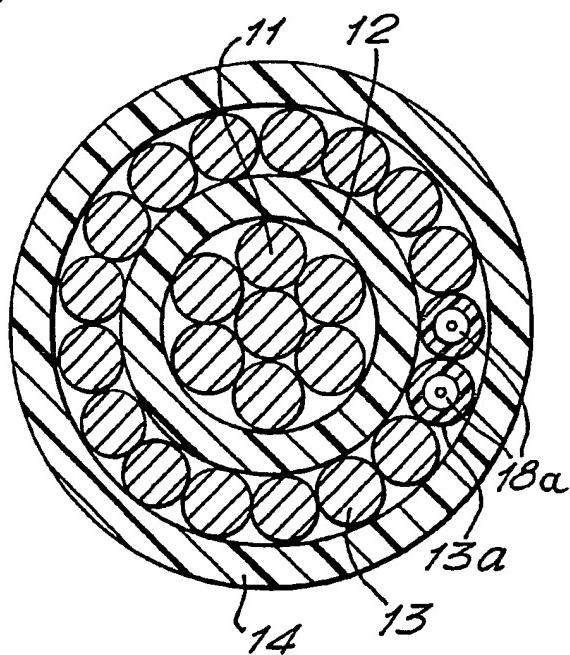


FIG. 2.



IMPROVEMENTS IN CABLES

This invention relates to cables, and in particular to cables containing both electrical and optical elements.

There is an increasing interest in the provision of services, e.g. telecommunications and television, to domestic users via fibre optic transmission medium. The introduction of this technology has however been restricted by the difficulty of obtaining wayleaves for the installation of the cables by which the services are to be provided. A further problem where services are to be provided to new properties is that a further group of contractors is required in addition to those providing the conventional installation. This adds to the cost of the installation.

The object of the invention is to minimise or to overcome these disadvantages.

According to the invention there is provided an electrical power supply cable including a line conductor, a neutral conductor disposed around the line conductor and insulated therefrom, and one or more fibre optic transmission elements incorporated within said cable.

The cable may be installed by the electrical utility who will already have any necessary wayleaves.

Embodiments of the invention will now be described with reference to the accompanying drawings in which:-

Fig. 1 is a cross-sectional view of an electrical cable incorporating fibre optic transmission elements; and

Figs. 2 and 3 show alternative cable constructions.

Referring to Fig. 1, the cable includes a stranded central "Line" conductor 11, e.g. of copper or aluminium, which conductor is sheathed with a first suitably colour-coded layer 12 of a plastics material. A stranded 'neutral' conductor 13 is laid up on the plastics sheath 12 and is in turn sheathed by a second colour-coded layer 14 of plastics material. The structure is encased in a protective plastics outer sheath 15.

The second plastics sheath 14 and the outer sheath 15 are provided each with longitudinal recesses or grooves 16, 17. These grooves are in register whereby to form tubes for accommodating optical fibre elements 18, these elements being a loose fit in the tubes so as to minimise axial strain on the fibre during cabling and/or installation operations.

In use, the line conductor 11 and the neutral conductor 13 are coupled respectively to one phase conductor and the neutral conductor of a three phase street or main cable. The optical fibre elements 18 are coupled to corresponding elements carried either within the street cable or within an optical cable laid adjacent the street cable.

At the user end of the cable, the line and neutral conductors 11 and 13 are coupled to the supply

meter and the optical elements are coupled to an optical termination unit disposed adjacent the meter.

Figs 2 and 3 show alternative cable constructions in which the fibre optic elements 18a are carried within plastics tubes 11a, 13a which occupy the place of a corresponding conductor strand. The fibre elements are exposed when the cables are prepared for jointing. In the constructions of Figs. 2 and 3 the outer plastics sheath 15 (Fig. 1) may be dispensed with.

It will be appreciated that the cable constructions described above are not limited to domestic supply applications but may also be employed e.g. in the cabling of an office building.

CLAIMS:

1. An electrical power supply cable including a line conductor, a neutral conductor disposed around the line conductor and insulated therefrom, and one or more fibre optic transmission elements incorporated with said cable.  
5
2. A cable as claimed in claim 1, having a plurality of said elements accommodated within tubes.
3. A cable as claimed in claim 2 wherein said conductors each comprise respective conductor strands stranded together, and said tubes each occupy the place of a strand.  
10
4. A cable as claimed in claim 3, wherein a said tube is stranded together with the strands of the line conductor.  
15
5. A cable as claimed in claim 3 or 4, wherein a said tube is stranded together with the strands of the neutral conductor.
6. A cable as claimed in claim 2, wherein said tubes are formed by longitudinal recesses in a plastics  
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sheath around said neutral conductor in registration  
with longitudinal recesses in an outer plastics sheath  
around said plastics sheath.

7. An electrical power supply cable substantially as  
5 hereinbefore described with reference to Fig. 1, 2 or  
3 of the accompanying drawings.

Examiner's report to the Comptroller under  
Section 17 (The Search Report)

Application number

GB 911145

## Relevant Technical fields

(i) UK CI (Edition K) G2J (JGCA1)

Search Examiner

MR C J ROSS

(ii) Int CL (Edition 5) G02B  
H01B

## Databases (see over)

(i) UK Patent Office

Date of Search

3 SEPTEMBER 1992

(ii)

## Documents considered relevant following a search in respect of claims

1-7

Category (see over)	Identity of document and relevant passages		Relevant to claim(s)
X	GB 2230108 A	(TELEPHONE CABLES) see especially page 3 lines 27-29 and page 4 lines 18-20	1 at least
X	GB 2227855 A	(TELEPHONE CABLES) see especially page 3 line 8 on and page 4 line 8 on	1 at least
X	GB 2214653	(STC) see especially Figure 3	1 at least
X	GB 1592192	(BICC) see especially Figure 1	1 at least
X	GB 1580863	(CABLES DE LYON) see especially page 2 line 120 on	1 at least
X	GB 1550588	(STC) see especially page 1 lines 74-75	1 at least
X	EP 0371660 A1	(STAMNITZ) see especially column 17 line 4 on	1 at least
X	EP 0359985 A2	(BOEING) see especially Figure 3B	1 at least

Category	Identity of document and relevant passages	Relevant claim(s)

#### Categories of documents

X: Document indicating lack of novelty or of inventive step.

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A: Document indicating technological background and/or state of the art.

P: Document published on or after the declared priority date but before the filing date of the present application.

E: Patent document published on or after, but with priority date earlier than, the filing date of the present application.

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Relevant Technical fields

- (i) UK CI (Edition ) Contd. from page 1  
(ii) Int CL (Edition )

Search Examiner

MR C J ROSS

Databases (see over)

- (i) UK Patent Office  
(ii)

Date of Search

3 SEPTEMBER 1992

Documents considered relevant following a search in respect of claims

Category (see over)	Identity of document and relevant passages	Relevant to claim(s)
X	WO 84/00820 A1 (CHEVRON) see especially parts 14, 22, 28 and page 13 line 7 on	1 at least
X	US 4936648 (SUMITOMO ELECTRIC) see especially Figure 1	1 at least
X	US 4787705 (FUJIKURA) see especially parts 12, 20, 22	1 at least
X	US 4579420 (OLIN) see especially column 6 line 50 on	1 at least
X	US 4521072 (FOPTICA) see especially column 5 line 40 on	1 at least
X	US 4239336 (ISEC) see especially column 3 line 10 on	1 at least

Category	Identity of document and relevant passages	Relevant to claim(s)

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